

those interested in the subject. The object of the paper was to show that for high furnaces it was unnecessary to calcine the limestone before using it.

Mr. W. Hackney read a paper on the designing of ingot moulds for steel rail ingots. Mr. Hackney has designed a mould in which the outside is rounded, the thickness of the metal being so adjusted at different parts of the circumference that the expansion under heat should be equal all round. This form has given satisfactory results, one proof of its correctness being that when it becomes heated to redness by an ingot of steel cast in it, the temperature of the outside is apparently equal all round.

Mr. Charles Wood described some improvements made by him in the hearths of blast furnaces. Another paper by Mr. Lowthian Bell described Mr. W. Price's retort furnace. In Mr. Price's furnace the temperature of the air, as well as that of the gaseous and fixed constituents of the coal, is raised by the waste heat before it enters the chimney. Mr. Price cannot compete with the Siemens furnace as regards intensity of temperature, but he avoids the loss which occurs in the gas-producers of the regenerative furnaces.

A paper by Mr. C. J. Horner, on the North Staffordshire Coalfields, had to be considerably curtailed, and two other papers had to be taken as read, in order that the excursion programme might be carried out. Indeed, one of the chief objects of the autumn meeting of the Institute is to visit places of interest from an industrial point of view, and hence the number of papers read is generally limited. This year the visits and excursions were very numerous indeed to industrial establishments in and around Manchester, and all of them seem to have been completely successful. Our space does not permit us to give a detailed account of these excursions, although many of the processes witnessed by the visitors were of considerable scientific interest. The meeting was brought to a successful termination on Friday by a visit, which formed, indeed, a hard day's work, to the North Staffordshire iron and coal district. From first to last the members of the Institute have good reason to be satisfied with the Manchester meeting.

In conclusion, we must express a hope that ere long our other great industries will follow the example of the iron and steel trade in forming their own special technological Institutes and holding meetings and publishing records of similar character and value to those of the Iron and Steel Institute.

RUTHERFORD'S "PRACTICAL HISTOLOGY"
Outlines of Practical Histology. By William Rutherford, M.D. (London : J. and A. Churchill, 1875.)

OF the different methods whereby the standard of scientific education is capable of being elevated, few will not place foremost the extension of theoretical studies into first principles and collateral branches which have a bearing, ever so little as it may appear to be, on the main subject. How much, for instance, does physiology suffer from a deficiency in mathematical and physical knowledge on the part of many of its most enthusiastic devotees. A wider general acquaintance with chemistry would, also, not be out of place. Practical aptitude and

experience no doubt stand next in importance. A mastery of the methods by which what is already known has been arrived at cannot but be one of the best trainings for original investigation. How many a valuable suggestion has been allowed to drop undeveloped, simply because of a want of manipulatory skill on the part of the deviser, whose love for the conception of his own brain is the only sufficient stimulus towards the realisation of its importance, and the working out of its details. All attempts to raise the standard and develop facilities for practical education deserve special attention. The work before us is one of the best of these.

The Notes on Practical Histology were published originally in the *Quarterly Microscopical Journal* for January 1872. Several additions have been made, and various fresh methods have been introduced. As it stands, the work contains all the information on the subject necessary for the student of medicine ; and we are certain that anyone who has mastered its details will be in a fit position to undertake high special investigation under favourable auspices. It is evident in every page that Prof. Rutherford is thoroughly master of every method he explains, as much from the minuteness of the detail into which he enters, as from the manner in which matter the least irrelevant is omitted. This is nowhere better seen than in the sections devoted to the "preparation of tissues previous to their examination," which, within a few pages, states exactly what is to be done in the way of preparation and preservation with the body of an animal, such as a guinea-pig, in order that all its tissues and organs, extending to such minutiae as the structure of the cochlea, shall be in a condition most favourable for detailed investigation.

The book is divided into two parts. The first of these treats of the microscope itself, together with the method of using it ; which account is followed by a series of histological demonstrations, explaining the manner in which each tissue and organ of the body must be manipulated in order to show its minute anatomical features. The following is an example under the head of *Nerve Tissue*. "The fibrillar structure of the processes of nerve-cells may be shown as follows. Cut the fresh spinal cord of a calf into pieces about a quarter of an inch in length. Place these for a month in a one per cent. potass. bichrom. solution. Remove a thin slice of the grey matter of the anterior horn with scissors, tease with needles, stain with carmine, and mount in glycerine." Among other special processes described, we find a novel one devised by Dr. William Stirling for exhibiting the structure of skin, which consists in partly digesting it, when stretched, in an artificial peptic fluid, and then staining. By so doing "the white fibrous-tissue swells up and becomes extremely transparent, thus permitting of a clear view of the other tissues." Dr. Urban Pritchard's method of exhibiting the structure of the organ of Corti is also fully explained.

The second part of the book consists of general considerations regarding histological methods. In it the relations of the tissues to surrounding media, the methods of hardening tissues (including the employment of the excellent freezing microtome introduced by the author) and of softening them, are fully explained ; as well as are the composition of the best staining fluids, and the most efficient means of preserving microscopic preparations.

One of the most important novel points of manipulatory detail which we notice, is the value of mucilage as an imbedding agent when the microtome is employed for freezing, as suggested by Dr. Pritchard. It depends on the fact that "frozen mucilage can be sliced as readily as a piece of cheese," a most valuable property, as all who have had any experience will acknowledge.

Prof. Rutherford has supplied a deficiency. He has given us a manual which will meet the requirements of a large class of students who will never find it necessary to enter into the details of practical histology so minutely as they are discussed in larger works, such as the "Hand-book for the Physiological Laboratory," or the still deeper manual of Stricker.

OUR BOOK SHELF

A Yachting Cruise in the South Seas. By C. F. Wood. With six photographic illustrations. (London : King and Co., 1875.)

MR. WOOD's narrative is so interesting that we wish it had been very much longer. He has made several voyages among the Pacific Islands during the last eight years, and, judging from this and what he tells us in the work before us, he must possess much valuable information concerning these islands, and especially with regard to their puzzling populations, which he would do well to publish in detail, and which would be welcomed especially by ethnologists. Mr. Wood is evidently a careful observer, and has the power of describing what he observes interestingly and clearly.

The present volume contains a narrative of a cruise which the author made, starting from New Zealand, from May to December 1873, among some of the most interesting groups of the Pacific Islands. Among the islands visited during this time were Rotumah, to the N.E. of Fiji, Futuna, Savaii, and Upolu, in the Samoan group; Niuafu, some of the islands in the Fiji group, the New Hebrides, the Solomon Islands, the Caroline Islands, Oualan, the Mulgrave Islands, and the Ellice group. Concerning every island which he visited, Mr. Wood has some interesting and valuable information to give, either about its physical condition, its products, its people, its history, or its antiquities. One of the main objects of his cruise was the collection of native implements and weapons, and in this he seems to have succeeded to his heart's content. His observations concerning the people seem to us especially valuable; he has gathered many traditions as to their migrations, and gives some specimens of folk-lore. In many of the islands the natives seem restless and discontented, and Mr. Wood was frequently petitioned to give them a passage from one island to another. Like many other Pacific voyagers, he has but a poor opinion of the results of the attempts which have been made to Christianise the natives. Not that he disapproves of attempting to civilise them and to raise them in the scale of humanity, but he thinks the methods which are generally adopted are quite abortive. The unmodified European garment of civilisation evidently cramps and enervates the Pacific Islander.

The information which Mr. Wood gives concerning the Rotumans, their traditions as to their predecessors in the island, their migrations, customs, superstitions, folk-lore, &c., is especially valuable. He refers briefly to the remarkable mounds among the hills in Bonabi, or Ascension Island, in the Caroline group, about which them have no tradition, but which would be likely to repay a careful examination. Quite as interesting, and still more wonderful, are the remains of large buildings of stone in the same island, some of the blocks of which are of immense size, and concerning which also the natives seem

to have no traditions. Mr. Wood believes these ruins to be the work of a people that have passed away, and it is very unlikely that the original buildings were the work of passing Spaniards, as has been supposed. We have certainly much yet to learn concerning the history and relationships of the Pacific Island populations, and it is a subject well worth careful investigation. Mr. Wood's modest volume is a valuable, though small, contribution to our knowledge of the subject; he must, we should think, have a great deal more to tell as the result of his long intercourse with these islands. The few autotype illustrations are appropriate and well executed.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Living Birds of Paradise in Europe

WE have just received at the Zoological Gardens of Dresden two living Birds of Paradise, viz., *Paradisea papuana*, from New Guinea, and *Paradisea apoda*, from the Aru Islands, both males, in excellent health and fine condition. Mr. von Below, Assistant-Resident of Makassar, in Celebes, brought them home in a three-months' passage from Makassar, via Java, Suez, Gibraltar, London, and Hamburg to Dresden, where he intends to spend the winter, and has deposited the birds in the Zoological Gardens. They have already been about three years in captivity with him at Makassar, where I saw them when passing through that place to New Guinea in 1873. The birds, therefore, are accustomed to cage-life, and as the conditions under which we have placed them are most favourable—consisting chiefly in a large space to allow free movement, and in an equal temperature of about 20° Réaumur—there is some hope of our being able to keep them alive. Mr. von Below got these birds through native traders who have their home at Makassar and trade to New Guinea and the Aru Islands. He fed the birds in India with grasshoppers, bananas, and rice, and on board the steamers with the same, cockroaches being substituted for grasshoppers. In Dresden we try to feed them with bread, rice, and worms (*Mehlwürmer*). Both are very active, and cry their well-known "wök, wök" with much force; the specimen of *Paradisea apoda* especially is not the least shy, and takes the worms out of one's hands. Their fine plumage suffered, of course, on the voyage, but I was astonished to see that it was not damaged more. As they probably will moult from about November till April, the plumage will not be at its finest condition till the month of May, and, supposing that the readers of NATURE will be interested in the further fate of these Birds of Paradise, I shall report in time how they are getting on.

I believe I am not mistaken in saying that a living specimen of *Paradisea apoda* has never before been alive in Europe. The two Birds of Paradise which Mr. Wallace brought home, which he had bought at Singapore, were *Paradisea papuana* (if I remember correctly, having no books at hand here); Mr. Cerruti, some years ago, brought over a specimen of *Seleucidès alba*, but I did not hear how long it lived in Europe. No other species of Birds of Paradise have yet been brought alive to Europe, so far as I know, and we may therefore felicitate Mr. von Below on having increased the number of these at least to three.

The inhabitants of those parts of New Guinea which I visited in 1873 are not accustomed to catch *Paradisea papuana* alive, as Mr. Wallace states is the case with *Paradisea apoda* from the Aru Islands; they only know how to kill the bird with the arrow, and I did not succeed in teaching them otherwise, but I suppose that the Papoos of the south-west coast of New Guinea know how to catch the Birds of Paradise alive, and that Mr. von Below's specimen is from that part of New Guinea.

Wildbad Gastein, Sept. II.

A. B. MEYER

Source of Volcanic Energy

MR. W. S. GREEN, like others of Mr. Mallet's supporters, takes wider ground than he did himself in his original paper. It is obvious that he regarded his experiments conclusive as to the amount of heat that could be produced by rock crushing